

IN THE CLAIMS

Please amend the claims as follows:

1-10. (Cancelled)

11. (Previously Presented) The radio station according to claim 30, further comprising:

a decision unit configured to decide whether or not communication is directly conducted with the radio control station based on a reception level of the control signal received by the control signal reception unit.

12. (Previously Presented) The radio station according to claim 11, wherein the decision unit changes a threshold for the reception level according to a transmission speed of the information signal and decides whether or not communication is directly conducted with the radio control station based on a result of comparison of the reception level and the threshold.

13. (Cancelled)

14. (Currently Amended) The radio station according to claim 30, further comprising:  
a communication route selector configured to select ~~a radio station~~ an optimal communication route satisfying a prescribed condition regarding a communication state if a plurality of response relay control signals indicating different communication routes respectively are transmitted from the direct radio station.

15-16. (Cancelled)

17. (Currently Amended) The radio station according to claim 14, wherein an information indicating a number of hops from ~~each~~ the source radio station to the radio control station is included in the response relay control signal, and the communication route selector selects ~~a radio station~~ the optimal communication route based on the number of hops included in the response relay control signal.

18. (Currently Amended) The radio station according to claim 14, wherein an information indicating an interference level is included in the response relay control signal, and the communication route selector selects ~~a radio station~~ the optimal communication route based on the interference level included in the response relay control signal.

19-24. (Cancelled)

25. (Currently Amended) The radio station according to claim 14, wherein information indicating a required transmission power is included in the response relay control signal, and the communication route selector selects ~~a radio station~~ the optimal communication route based on the required transmission power included in the response relay control signal.

26. (Currently Amended) The radio station of claim 14, wherein the communication route selector is configured to determine the optimal communication route for the information signal, which minimizes a total transmission power of radio stations relaying the information signal.

27. (Currently Amended) The radio station of claim 14, wherein the communication route selector is configured to determine the optimal communication route for the information signal by selecting a radio station having a smallest relative transmission power.

28. (Currently Amended) The radio station of claim 14, wherein the communication route selector is configured to determine the optimal communication route for the information signal to maximize a signal-to-interference ratio while minimizing a number of hops in the communication route.

29. (Currently Amended) A multi-hop communication system configured by a radio control station and a plurality of radio stations, wherein, one radio station included in the plurality of the radio stations comprises:

a control signal reception unit configured to receive a control signal, broadcast from the radio control station, for communication connection with the radio control station ~~from the radio control station~~;

a reception level measuring unit configured to measure a reception level of the control signal broadcast from the radio control station, at the one radio station;

a relay controlling unit configured to receive a relay control signal to which a reception level of the control signal at an other radio station is added, the relay control signal being transmitted from a source radio station to the radio control station so as to set a communication route from the source radio station to the radio control station via at least one radio station; and

an information signal transmission/reception unit configured to relay an information signal, which is different from the control signal, to an other radio station according to a the communication route in which the relay control signal is relayed, wherein

when the reception level added to the relay control signal is smaller than the reception level at the one radio station, the relay controlling unit adds the reception level at the one radio station to the received relay control signal, and relays the relay control signal, to which the reception level at the one radio station is added, to other neighboring radio stations;

a direct radio station which can transmit the information signal to the radio control station directly, among the plurality of the radio stations, transmits a response relay control signal notifying the communication route in which the relay control signal is relayed, in response to receiving the relay control signal; and

~~a transmission~~ the source radio station, which is a source of the information signal, transmits the information signal according to the route notified by the response relay control signal.

30. (Currently Amended) A radio station, comprising:

a control signal reception unit configured to receive a control signal, broadcast from a radio control station, for communication connection with a the radio control station ~~from the radio control station~~;

a reception level measuring unit configured to measure a reception level of the control signal broadcast from the radio control station, at the radio station;

a relay controlling unit configured to receive a relay control signal to which a reception level of the control signal at an other radio station is added, the relay control signal being transmitted from a source radio station to the radio control station so as to set a communication route from the source radio station to the radio control station via at least one radio station; and

an information signal transmission/reception unit configured to relay an information signal, which is different from the control signal, to an other radio station according to a the communication route in which the relay control signal is relayed, wherein

when the reception level added to the relay control signal is smaller than the reception level at the radio station, the relay controlling unit adds the reception level at the radio station to the received relay control signal, and relays the relay control signal, to which the reception level at the radio station is added, to other neighboring radio stations;

when the radio station is a source of the information signal, the information signal transmission/reception unit transmits the information signal according to a the communication route notified by a response relay control signal which is transmitted by a direct radio station capable of transmitting the information signal to the radio control station directly; and

the response relay control signal is transmitted by the direct radio station in response to receiving the relay control signal at the direct radio station.

31. (Currently Amended) A multi-hop communication method for a radio control station and a plurality of radio stations comprising:

receiving, by one radio station of the plurality of radio stations, a control signal, broadcast from the radio control station, for communication connection with the radio control station ~~from the one radio control station~~;

measuring a reception level of the control signal broadcast from the radio control station at the one radio station;

receiving a relay control signal to which a reception level of the control signal at an other radio station is added, the relay control signal being transmitted from a source radio

station to the radio control station so as to set a communication route from the source radio

station to the radio control station via at least one radio station;

comparing, at the one radio station, the reception level added to the relay control signal with the reception level of the one radio station;

adding the reception level at the one radio station to the received relay control signal, and relaying the relay control signal, to which the reception level at the one radio station is added, to other neighboring radio stations, when the reception level added to the relay control signal is smaller than the reception level of the one radio station;

transmitting, at a direct radio station which can transmit the information signal different from the control signal to the radio control station directly, a response relay control signal notifying the communication route in which the relay control signal is relayed, in response to receiving of the relay control signal;

transmitting, at a source radio station which is a source of the information signal, the information signal according to the communication route notified by the response relay control signal; and

relaying the information signal to an other radio station according to a the communication route notified by the response relay control signal.